

## HOW I DO IT

# Sentinel Node Biopsy in Malignant Melanoma

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In the past, many surgeons performed routinely elective node dissection for intermediate thickness melanomas on the intuitive reasoning that by so doing one would eliminate microscopic nodal metastases in some patients, and thereby decrease further metastases into the blood stream that might have occurred had the microscopically nodal metastases been allowed to grow into palpable nodes [1]. However, two prospective randomized studies showed no survival benefit from elective node dissection [2,3]. The recently reported results of the multiinstitutional, randomized surgical trial indicate that elective node dissection is beneficial for patients younger than 60 years with melanomas 1–2 mm thick without ulceration [4]. However, only a minority of the patients with elective node dissection have histologically positive nodes, and therefore the majority of the patients with elective dissection have an unnecessary operation.

The technique of sentinel node biopsy pioneered by Morton et al. provides a simple method in determining the histologic status of a clinically negative regional nodal basin, through the biopsy of the sentinel node (SN), i.e. one or occasionally two nodes picking up the dye or radioactive tracer injected before at the melanoma site [5]. The advantages of this method are obvious since with a lymph node biopsy the status of the regional nodes can be determined and a complete node dissection (with its attendant morbidity, particularly in the groin) can be avoided for the majority of the patients who do not have microscopic nodal metastases. In addition, to staging information, adjuvant therapy may be elected in the case of positive nodes [6].

### OPERATIVE TECHNIQUE

Isosulfan blue dye is injected at the dose of 3 ml, intradermally on the side of the biopsy incision facing the nodal basin (Fig. 1). For a transverse biopsy incision the dye is injected near the middle of the side facing the nodal basin, and for a longitudinal biopsy incision around the end of the incision facing the nodal basin.

In the case of an extremity, the limb is prepared and draped (with a stockinette) and is elevated for 5 min. It is then placed on folded sheets so that the distal part of it still remains slightly elevated while the incision over the nodal basin is made. In the case of a trunk lesion, the table is tilted following the intradermal injection to facilitate the flow of dye toward the nodal basin. In some patients we have injected the dye intradermally prior to anesthesia and positioned the patient for 5 min in such a way as to facilitate by gravity the flow of dye toward the regional nodes. For lesions draining to two nodal areas, we inject first on one side of the biopsy incision, do the sentinel node biopsy on the nodal basin facing this side, and then inject the other side of the biopsy incision and proceed with the corresponding sentinel node biopsy.

The incision over the nodal basin is performed in the same way as for a node dissection. It is, however, considerably shorter, about 1/2 to 1/3 of the incision used for groin or neck dissection and slightly shorter in the axilla. Sharp dissection with scalpel or light cautery straight down to the surface of the nodes is carried out while watching intensely for any blue-stained lymphatic channel. If a blue channel is identified, it is traced to the sentinel node. About half of the time one finds first a lymphatic channel. As the nodal group is approached and one starts seeing through the areolar tissue lymph nodes, then one dissects on top of the conglomerate of the nodes toward the primary site raising thus a thick “flap” consisting of skin and all the thickness of the subcutaneous fat to the surface of the lymph nodes (Fig. 2). Scissors or clamp dissection is avoided up to this point as their use creates multiple tissue planes in which one can get literally lost in the axilla. Once the nodal group is exposed,

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# Nodal Basin



Fig. 1. The dye (shaded area) is injected on the side of the biopsy incision (A) or near its end (B) facing the nodal basin.

then such dissection is helpful in separating the nodes to identify the one colored blue. Once the blue-stained node is seen further dissection is required to establish its continuity with stained lymphatic channels and to rule out the presence of additional sentinel nodes.

Following removal of the SN and while the frozen section results are awaited, the incision is closed. If a suction drain is used, the exit point is preferably placed near one end of and on the same line as the incision. If the frozen section returns positive, one then makes an elliptical incision encompassing the biopsy incision and drain exit point. Flaps are then raised and the node dissection is completed removing en bloc the lymph nodes with the overlying incision and drain site, ideally without ever entering the biopsy cavity.

## DISCUSSION

The principles outlined above were based on simple intuition. Bright staining of the SN would require the rapid flow of an adequate amount of dye to that node. Hence the use of gravity and the injection of the large (3 ml) amount of dye. Although about half of the dye diffuses into the subcutaneous fat, this does not seem to be a problem in terms of staining additional sentinel nodes or deeper lymphatics coursing along the major vessels.

With a smaller amount of dye, if the SN is not stained visibly, the injection of additional dye later may not be helpful as one may have interrupted the afferent lymphatic channels near the SN at the first attempt. The reason for injecting the dye on the side facing the nodal basin is apparent. Injection on the other side would force the dye through a more circuitous lymphatic route which can cause a delayed and slower arrival to the SN and a fainter or absent coloration of the node.

The SN is the ultimate objective of this operation. One then might as well dissect directly to the surface of the nodes. Raising a thin flap toward the primary site might be disadvantageous in two ways. One is that the plane of contact with the lymphatic channels is a narrow one and one might easily miss and cut them. The other reason is that by raising a thin flap one potentially contaminates planes which are used in the performance of a node dissection. By dissecting straight down to the surface of the nodes one is bound to find the SN or the stained lymphatic channels close to their entry in the node. The lymphatic channels become stouter as they converge and come close to their entry into the node.

With the above technique, the SN is identified in most patients within 15 min. This technique has been applied to 67 patients (5 had drainage to two basins) with recently diagnosed melanoma, located in the upper (17) or lower (21) extremity, anterior trunk (8), back (13), and the head and neck area (8). The SN was identified in 23/23 groins (positive SN in 3), 40/41 axillae (positive SN in 11), and 4/8 in the neck (positive SN in 2). Overall, the rate of identification of SN with the use of blue dye alone was 67/72 basins (93%), with 18/72 (25%) positive SN on routine histologic analysis, and 13/72 (18%) with more than one SN.

It is hard to say whether any of the above minor technical modifications to the original technique by Morton et al. has any value. They have not been tested against their original technique, since they were applied as such intuitively from the outset of our experience. In a way they were our interpretation of their technique. Hopefully, as the surgeons worldwide try this technique its operative details will be further crystallized, so that this

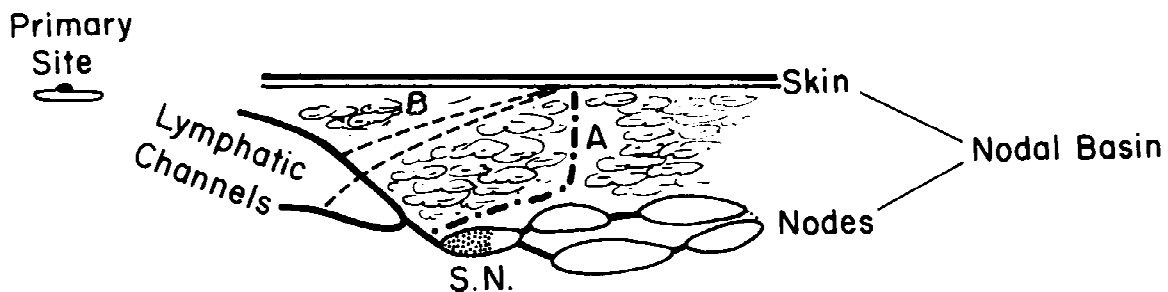


Fig. 2. A direct dissection plane to the surface of the regional nodes (A) is preferred over a thin flap (B) toward the primary site in an attempt to find first the colored lymphatic channels. S.N. = Sentinel Node (partially shaded in the drawing).

significant surgical contribution in the management of melanoma can be part of the armamentarium of every surgeon treating melanomas.

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